



161-52

(6780)
6500
Box

Buffalo Resource Area

Wetland Habitat Management Plan



HD
243
.W8
B84
1987
c. 2

Wyoming Game and Fish Department
Bureau of Land Management
Casper, Wyoming

UNITED STATES DEPARTMENT OF THE INTERIOR

Bureau of Land Management

BUFFALO WETLANDS HABITAT MANAGEMENT PLAN

WY-060-WHA-T1

Johnson, Sheridan, and Campbell Counties, Wyoming

Prepared by Larry Gerard, Wildlife Biologist
Buffalo Resource Area
Casper District

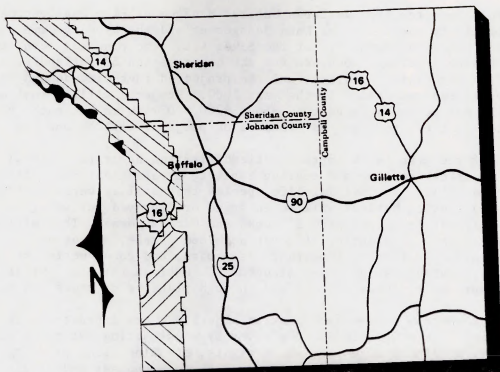
Approved by:

Larry Gerard, Acting
District Manager, Casper
Bureau of Land Management

5/5/88
Date

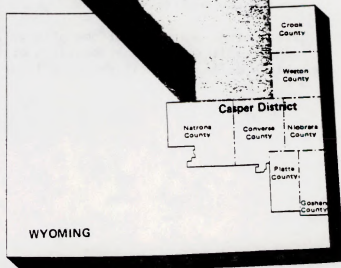
Director
Wyoming Game and Fish Department

Date



**WETLANDS
HABITAT MANAGEMENT PLAN
AREA**

**HMP Area Includes All Portions
of Resource Area East of Areas
Covered By Diagonal Lines**



WYOMING

ABSTRACT

The Buffalo Resource Area Wetlands Habitat Management Plan has been developed cooperatively by the Bureau of Land Management and the Wyoming Game and Fish Department under the authority of the Sikes Act. The plan has been prepared in response to a national concern for the conservation of wetland/riparian habitat and associated wildlife, and the projected increased demand for wildlife-related recreation by the year 2000. Projects will be implemented over a 15-year period at a cost of about \$200,000 with an estimated benefit to cost ratio of three to one. Maintenance of projects will be ongoing.

The goal of the plan is to improve wetland/riparian habitat. This will improve waterfowl nesting and rearing habitat, create additional fish habitat, and improve habitat for all wildlife species that utilize wetland sites. Nesting and rearing habitat will be enlarged or improved for waterfowl species such as mallard, teal, and gadwall ducks and Canada geese. This will be accomplished through planting of cover and food plants, management of livestock grazing, fencing important reservoirs, and construction of new reservoirs, nesting islands, and structures. Habitat for other wildlife also will be improved by these actions and through planting of trees and shrubs.

Planned actions for achieving fisheries objectives are improvement of the Trabing Reservoir and Belle Fourche River by constructing water control structures, obtaining necessary water rights, stocking fish, planting trees, and eventually providing user facilities such as outhouses and picnic tables. Other reservoirs that contain game fish will be maintained or improved to continuously support a fishery.

Maintenance and improvement of existing wetlands for livestock watering will prevail in all project proposals. Any proposed fencing for the improvement of waterfowl or fisheries habitat will include provisions to supply needed water for livestock watering at the site. Improved watershed conditions (increased vegetation and reduced soil compaction) will increase the life expectancy of wetlands and reduce the frequency of repairs to dams because bands of vegetation trap silt and protect dams. Livestock also will benefit through improved water quality.

In effect, implementation of the plan will result in improvement of the watershed condition and the condition of wetlands for wildlife and for domestic species that utilize these important ecosystems.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CHECKLIST FOR PREPARATION AND REVIEW
OF HABITAT MANAGEMENT PLANS

State
Wyoming
District
Casper
Resource Area
Buffalo
HMP Name and Number
Buffalo Wetlands WY-060-WHA-T1
HMP Prepared by
Larry Gerard

REVIEW CHECKLIST	RA Surname/Date	DO Surname/Date
1. Master Memorandum of Understanding, Sikes Act Agreement and/or Supplemental with State Agency.		Aug. 19, 1976
2. Preliminary meeting(s) with State Agency or other appropriate cooperators to jointly discuss HMP objectives.		April, 1986
3. Endangered Species Act Compliance completed by	Gerard 2/23/87	
4. Review by District Resource Area Specialists		
Range	Hannan 4/5/87	
Wild Horse and Burro		
Hydrologist		
Forestry	Schick 5/5/87	
Fisheries Botanist Wildlife Biologist	Gerard 5/5/87	
Lands	Kolnick 5/5/87	
Minerals	Lande 5/5/87	
Recreation	Gerard 5/6/87	
Wilderness ACEC	Schick 5/5/87	
Cultural	Earle 5/5/87	
Visual		
Environmental Coordinator (recreational EA's)		
Support (Chief of Operations, Fire Management)		
Others		
5. Reviewed by Area Manager	J. Bessinger 5/7/87	
6. Reviewed by Chief of Resource Management		
7. Draft HMP and EA reviewed by State Agency authorized officer		
8. Final review (re: map updates) by State Director		
9. Reviewed and approved by District Manager		
10. Approved by State Agency authorized officer		

Remarks

TABLE OF CONTENTS

ABSTRACT	III.
INTRODUCTION	1
Reason for Preparation	1
Authorities and Consistency	2
Compliance with NEPA	2
LAND STATUS AND ADMINISTRATION	3
ECOSYSTEM DESCRIPTION	3
RELEVANT CONSTRAINTS	4
MANAGEMENT OBJECTIVES	5
Introduction	5
Objectives	5
PLANNED ACTIONS	6
SPECIFIC PRACTICES	9
EVALUATION AND MONITORING	13
COORDINATION	15
ECONOMICS	21
PUBLIC AFFAIRS	24
APPENDICES	21
APPENDIX 1: WYOMING GAME AND FISH DEPARTMENT STRATEGIC PLAN OBJECTIVES, GOALS, AND RECOMMENDATIONS	27
APPENDIX 2: CATEGORIZATION OF WETLANDS CONDITION	31
APPENDIX 3: WETLAND SITES ON WHICH IMPROVEMENT PROJECTS ARE RECOMMENDED	33
APPENDIX 4: ENVIRONMENTAL ASSESSMENT	39
APPENDIX 5: MEMORANDUM OF UNDERSTANDING	43
REFERENCES	49

INTRODUCTION

REASONS FOR PREPARATION

This habitat management plan (HMP) has been prepared in response to local and national concern for the conservation of wetland habitat and associated wildlife. The Bureau of Land Management (BLM) issued a final policy statement in 1987 to focus appropriate attention on the management of riparian/wetland habitat on BLM-administered public land. A Bureauwide water fowl habitat management initiative as well as a draft riparian area management inventory and monitoring handbook were also released in 1987. These policy statements provide broad guidelines for management of this important resource.

Although the terms "wetland habitat" and "riparian habitat" often are used interchangeably, the term "wetland" is preferred for purposes of this document. A wetland habitat is an area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions.

One of the primary objectives of the HMP is to increase waterfowl numbers. There are numerous opportunities to improve habitat for this important resource. In addition, nearly all wildlife that use wetland habitat will benefit from projects to improve this habitat, since the BLM's policy is to manage on an ecosystem basis. Establishing sport fish habitat will create additional reservoir fishing opportunities.

The primary breeding range of North American waterfowl is an area frequently referred to as the Prairie Pothole region, which includes parts of Minnesota, North Dakota, South Dakota, Montana, Alberta, Saskatchewan, and Manitoba. This area provides breeding habitat for more than 50% of the ducks in North America. Intensive agricultural practices, coupled with ever-increasing drainage of natural wetlands has significantly reduced waterfowl breeding habitat (Burwell and Sugden 1964).

The area covered by this HMP lies immediately south and west of the Prairie Pothole region; it is used primarily for livestock grazing. Several studies have been conducted on the importance of livestock watering ponds for waterfowl production (Gjersing 1971, 1975; Mundinger 1975; Rundquist 1973). In light of the decreasing amount of wetland habitat in the Prairie Potholes region, efforts to maximize waterfowl use and production on wetlands associated with such ponds in the HMP area are appropriate and timely.

Acre for acre, wildlife use of wetland habitat far exceeds use of any other terrestrial type in the area, according to documented studies (USDA, FS 1979; Wooding 1973) and a wetland habitat inventory conducted in the BLM's Buffalo Resource Area in 1977.

Currently, the less than desirable habitat conditions at wetland sites in the HMP area result from the following factors:

Season-long and heavy livestock use removes vegetation through grazing and trampling. Trampling also causes soil compaction.

Erosion and large fluctuations in water depth cause poor water quality. This limits habitat conditions for waterfowl and other wildlife and decreases fish production.

Because of the above factors, important wetland vegetation such as bulrush, cattail, willow, and cottonwood does not proliferate.

Management proposals in this HMP follow BLM ecosystem management guidance as directed in Section 6780 of the BLM Manual, "Habitat Management Plans." This guidance requires maintenance of habitat already in satisfactory condition, and improvement of habitat in unsuitable condition for all wildlife.

The actions carried out under this HMP to improve wildlife habitat also will improve watershed conditions, water quality, and ecosystem diversity. In addition, they will extend the life of reservoirs, allow for better forage use and livestock distribution, and increase wildlife-related recreation.

AUTHORITIES AND CONSISTENCY

Authority for development of this HMP is found in laws, regulations, executive orders, and BLM policy. The Federal Land Policy and Management Act of 1976 (FLPMA) the Public Rangelands Improvement Act of 1978 (PRIA), and the Sikes Act support such action. Section 6740 of the BLM Manual directs personnel to comply with numerous mandates, especially Executive Order 11990, which calls for protection of wetlands. Section 6780 of the BLM Manual presents procedures for preparation of HMPs.

The development of this HMP is consistent with the Buffalo Resource Area's resource management plan (RMP) (USDI, BLM 1985). An HMP specific memorandum of understanding signed by the BLM and the Wyoming Game and Fish Department (WGFD) in 1988 provides for cooperative wildlife management by the two agencies to implement the Sikes Act (appendix 5). The WGFD's strategic plan contains numerous references that support efforts proposed in the HMP (see appendix 1).

COMPLIANCE WITH THE NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act of 1969 (NEPA) requires that an environmental evaluation be completed before any federal action is undertaken. All the planned actions except fisheries reservoir construction and land tenure adjustments are covered in an Environmental Assessment included in appendix 4.

THE HMP AREA

LAND STATUS AND ADMINISTRATION

The HMP area, which is in northeastern Wyoming, encompasses portions of Johnson, Sheridan, and Campbell counties (see the Location map in the front of the document). The land ownership status is shown in table 1. The HMP includes all of the public land administered by the Bureau of Land Management in three counties with the exception of the areas covered by the South Bighorn and Middle Fork HMP.

TABLE 1
LAND OWNERSHIP AND MANAGEMENT

<u>BLM</u>	<u>Forest Service</u>	<u>State</u>	<u>Private</u>	<u>Total</u>
656,425	158,002	562,700	4,881,212	6,258,339
10%	3%	9%	78%	

ECOSYSTEM DESCRIPTION

Topography/Precipitation/Vegetation

Elevation of the land in the HMP area ranges from 3,800 feet to 6,000 feet. Precipitation varies from 10 inches in southern Johnson County to 17 inches near the face of the Bighorn Mountains. The land is classified into three precipitation/vegetation zones that correlate with elevation and precipitation (SCS 1976).

Approximately 68% of the HMP area lies in the 10 to 14-inch Northern Plains precipitation/vegetation zone. This zone includes most of the HMP area in eastern Johnson and Sheridan counties and in the southern half of Campbell County. The dominant vegetation types are sagebrush, grassland, and cropland.

About 20% of the HMP area is in the 15 to 17-inch Northern Plains precipitation/vegetation zone. This land is in northern Campbell County. The principal vegetation types in this zone are sagebrush, grassland, and scattered conifer.

The 15 to 19-inch Foothills and Mountain East precipitation/vegetation zone includes land in the HMP area along the east face of the Bighorn Mountains and in central Sheridan County. Approximately 12% of the HMP area is in this zone. The principal vegetation types are dense timber, grasslands, croplands, mountain shrub, and sagebrush.

The HMP area is drained in the northern and central portions by the Powder River, in the northwest by the Tongue and Little Bighorn rivers, and in the east by the Belle Fourche, Cheyenne, Little Powder, and Little Missouri

ivers. All of these rivers are tributaries of the Missouri River system. Most perennial streams in the HMP area originate in the Bighorn Mountains to the west.

Habitat Types

This HMP is concerned with two habitat types on BLM-administered public lands: the palustrine and the riverine. The palustrine (marsh) type is associated with approximately 200 stock-watering reservoirs and approximately 10 springs; the riverine is associated with approximately 5 miles of perennial streams.

Wildlife

Common avian species that nest in or near wetland areas are mallard, pintail, blue-winged teal, green-winged teal, and gadwall ducks, eared grebe, American coot, American avocet, killdeer, spotted sandpiper, and common snipe. Common mammals that occur near wetland areas include muskrat, raccoon, skunk, mink, and fox.

Game and nongame fish distribution on public land in the area is limited to perennial streams and three or four livestock reservoirs. Most stock-watering reservoirs in the HMP area are not deep enough to support fish year-round; however, opportunities exist for modification of existing reservoirs or new construction to support fisheries.

RELEVANT CONSTRAINTS

General Constraints

This HMP was prepared within all known constraints resulting from laws, policies of the Department of the Interior and the BLM, other program requirements, and decisions in the Buffalo RMP (USDI, BLM 1985). The RMP/EIS and record of decision are available for review in the Buffalo Resource Area office in Buffalo, Wyoming.

Sikes Act Authority

This HMP was prepared and is to be implemented under the authority of the Sikes Act. It meets the criteria of the statewide Memorandum of Understanding (MOU) between the Wyoming Game and Fish Commission and the Bureau of Land Management and the specific HMP MOU for cooperation in preparing and implementing HMP's.

MANAGEMENT OBJECTIVES

INTRODUCTION

General goals in the Buffalo RMP relating to wetlands management are to improve wetland areas that are in less than satisfactory condition, to develop additional areas for increased waterfowl production, to create additional fisheries and waterfowl habitat, and to improve habitat for all wildlife species that use wetland areas. Appendix 2 of this document describes the criteria used to evaluate wetland condition.

OBJECTIVES

On the basis of the RMP goals described above and multiple use recommendations, the following HMP objectives have been developed.

Objective 1

Improve nesting and rearing habitat for ducks and/or geese on 5 sites a year, for a total of 50 wetland sites.

Objective 2

Create sport fish habitat in at least two reservoir sites through modification of existing sites or new construction.

Objective 3

Create or improve wetland habitat for various wildlife species by constructing at least one new reservoir or modifying two existing wetland sites annually.

PLANNED ACTIONS

Planned actions described in this section are listed in order of the priority that has been assigned to achieve maximum benefits at minimum cost. However, the order in which projects are carried out will be determined by the availability of funds.

PLANNED ACTION 1

Wetland habitat improvement practices will be included in the routine planning efforts of the range program for construction of range improvement projects.

This indirect action will have top priority because waterfowl production and wildlife habitat improvement practices often can be included with regularly scheduled range surveys, allotment management plans (AMPs), or reservoir construction and maintenance. Such combining of projects makes habitat improvement practices feasible with minimal effort and expense.

BLM personnel will continually seek to identify wetland areas in less than satisfactory condition that could be improved by a change in livestock management practices. Such changes as season of use, length of use, fencing, or herding can enhance watershed and wetland vegetation and improve water quality so that wetland habitat for wildlife is improved at minimal expense.

PLANNED ACTION 2

Waterfowl production will be improved on existing reservoirs and wetland sites, and habitat for other wildlife also will be improved.

Projects selected to improve waterfowl production and to enhance habitat for other wildlife will be those that will achieve maximum benefits at minimal cost. Some possible projects are installation of fences to protect wetland habitat, construction of goose nesting platforms or floating islands, and planting of emergent vegetation and/or trees. In many cases the only additional expense would be materials; labor could be performed by existing personnel or by volunteers.

BLM personnel will evaluate wetland sites in the field and divide those recommended for habitat improvement projects into three categories: (1) sites that do not appear to be limited by grazing activity; (2) sites on which fencing or a change in grazing activity appears to be required; and (3) sites with good potential on which monitoring will be required before recommendations can be made. The tables in appendix 3 list the sites in each category.

The following important factors were considered when priority was assigned to wetland sites on which habitat improvement projects are needed (i.e. Tables AP3-1 through AP3-3):

Priority was assigned to reservoirs in which the amount of water stored is greater than one surface acre in most years.

If livestock grazing has reduced or eliminated upland and wetland vegetation around wetlands or within a watershed to the extent that use by waterfowl and other wildlife is severely limited, those areas received priority.

Priority was also assigned to sites on which habitat improvement practices to increase subsequent wildlife use would be relatively easy.

Low-cost projects and reservoirs with a relatively long remaining functional life received higher priority.

PLANNED ACTION 3

Existing reservoirs or wetlands with suitable fisheries habitat will be identified, and introduction of game or nongame fish appropriate to each habitat will be recommended to the Wyoming Game and Fish Department.

Two wetland areas on public land have been tentatively identified as having a potential for fisheries. Both contain nongame fish and are accessible by county roads. They are the Trabing Reservoir in T. 48 N., R. 81 W., section 25, NENW, and a section of the Belle Fourche River in Campbell County in T. 46 N., R. 71 W., section 9, SESW. The BLM and the WGFD will evaluate the two sites in the future for suitability, potential for supporting game fish, and estimated cost of development. Questions concerning water rights, minimum pools, and other problems must be addressed before development.

The two agencies will continue to identify existing reservoirs that have suitable habitat for support of game and nongame fish, and all reservoirs that appear to have potential for supporting a fishery will be evaluated. Game fish normally will be introduced only where some recreational use is possible. Naturally reproducing populations will be considered for areas where access is difficult and use would be low, because continuous stocking would not be required. Nongame fish species capable of natural reproduction could be introduced in areas where little fishing would occur as a prey source for some avian and mammalian species.

PLANNED ACTION 4

In highly accessible areas, existing reservoirs will be modified or new reservoirs will be constructed to create sport fisheries. No suitable sites have been identified at this time; however, additional sport fishing sites are

needed near Gillette. A high priority will be given to this planned action when local agencies agree to cooperate in the development and maintenance of sport fish reservoir sites.

Sites selected for construction of sport fish reservoirs will be those that will support sport fish yearlong and those with a relatively long remaining life.

In fiscal year 1987, the BLM and the WGFD will identify sites that have potential for establishment of reservoir sport fisheries. After sites are evaluated, priorities will be assigned on the basis of the apparent suitability of each site. Funds will be sought when there is public support for the construction of sport fishing sites.

PLANNED ACTION 5

The feasibility of land tenure adjustments will be investigated if such adjustments could increase access to and improve management of wetland habitat.

Most wetland habitat in the HMP area is on private land. The following specific actions could be considered:

Land exchanges to consolidate public land into more manageable units, to increase public access for wildlife enjoyment, or to make projects more economically feasible.

Investigation of the feasibility of selling scattered tracts of public land and pooling the receipts of such sales to purchase access or important habitat sites.

Cooperation between the BLM and the WGFD to acquire conservation easements to protect the habitat and provide easements along wetland areas for public hunting and fishing. Under such an arrangement a landowner would agree to not develop or otherwise degrade wetland habitat in exchange for land or interest in land elsewhere, or some other form of compensation.

Investigation of the feasibility of "exchange of use" agreements between the BLM and private landowners for the protection or enhancement of wetland sites. Such agreements could include allowing cultivated crops to be planted on public land in exchange for the landowner's leaving or planting cover or food plots for waterfowl on private land.

A low priority has been assigned to this planned action because of potential problems in implementing the actions or agreements outlined above. The specific actions described will be pursued only after the agencies or landowners involved have indicated they are willing to consider them. BLM-managed public land proposed for exchange will be limited to that identified as suitable for exchange in the Buffalo RMP (USDI, BLM 1985). The RMP can also be amended if the proposal is in the public interest.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

HABITAT MANAGEMENT PLAN PROGRESS REPORT

OBJECTIVES	DATE COMPLETED	PLANNED ACTIONS	DATE COMPLETED	EVALUATION/MONITORING	DATE COMPLETED
1. Improve nesting and rearing habitat for ducks and/or geese on 5 sites a year for a total of 50 wetland sites.		#1, 2, 5		-Waterfowl use and production, -Vegetation-habitat survey. -Project effectiveness, -Recreational use,	
2. Create sport fish habitat in at least two reservoir sites through modification of existing sites or new construction.		#3, 4		-Fish population surveys, -Aquatic habitat survey.	
3. Create or improve wetland habitat for various wildlife species by constructing at least one new reservoir or modifying two existing wetland sites, annually.		#1, 2, 5		-Other wildlife use, -Vegetation-habitat survey. -Project effectiveness.	

INSTRUCTIONS

1. List specific HMP objectives as developed from RMP/MFP planning documents or as otherwise approved.
2. List specific planned actions to be initiated to meet each specific objective.
3. List scheduled evaluation/monitoring study(s) planned to evaluate accomplishments.
4. Enter completion date for each objective, action, or evaluation/monitoring study as accomplished.

SPECIFIC PRACTICES TO IMPROVE HABITATS

In addition to the planned actions described above, other practices can be considered that may help achieve objectives of this HMP. Examples of specific practices that have been used successfully elsewhere were described in the reservoir HMP for the Grass Creek Resource Area (USDI, BLM 1983a); they are also applicable to this area. Depending on habitat conditions and the objectives for a given wetland area, some of the practices listed below may be implemented.

Habitat for Waterfowl (Ducks and Geese)

Dig or blast pits in reservoirs that dry up to ensure maintenance of water for fledging of ducks.

Design new reservoirs with shallow flats for growth of submergent and emergent plants and waterfowl feeding.

Introduce desirable vegetation into reservoirs and in adjacent nesting areas for waterfowl food and cover. Desirable vegetation is submergents, emergents, forbs, and grasses.

Build islands for waterfowl nesting and escape cover.

Build waterfowl production reservoirs in clusters and locations where long-term benefits are ensured.

Install and evaluate various floating island-type structures for isolated nesting and resting sites.

Install and evaluate various types of goose and duck nesting structures.

Remove silt from old waterfowl producing reservoirs to lengthen physical production life of these sites.

Manage livestock use by available methods to ensure maintenance and availability of waterfowl food supplies and of nesting and rearing cover.

Design maintenance of projects to include improvements for waterfowl production and for general retention of existing wetland habitat.

Increase depths of shallow, silted reservoirs containing good habitat by raising elevation of spillways or weep pipes to the extent acceptable from an engineering standpoint.

Fisheries

Install drawdown facilities in sport fish reservoirs to facilitate management.

Drill wells to establish water supplies where necessary to achieve site objectives, or build reservoirs where good artesian supplies exist.

Construct sport fish reservoirs near population centers and/or with legal public access.

Build sport fish reservoirs as large as feasible, and design them so that a water depth of 12 to 14 feet will be maintained over at least one-fourth of the pond's area during freezeup.

Install facilities for user safety and comfort, and plant trees to create a desirable setting at sport fish reservoirs. (Facilities could be installed cooperatively with some other agency to minimize costs and maintenance.)

Build sport fish reservoirs in clusters to achieve a greater variety of fishing recreation in one area.

To maintain fish habitat, establish control of water levels by available means such as water rights or agreements.

Install fish cover structures in warm water sport fish reservoirs.

Create spawning areas where needed in warm water sport fish reservoirs.

Use feasible oxygenation techniques where needed to improve winter survival of valuable sport fish.

Through exchange, acquire lands ideal for sport fish reservoirs near population centers where suitable public land is not available.

Assist WCFD in establishing sport fish, and manage the habitat in balance with the selected fisheries (put-and-take, fingerling trout, or reproducing warm water fish).

Erect signs at established sport fish reservoirs, and publicize these areas through news releases.

Improve public access where needed to ensure sport fish utilization.

Improve water clarity in turbid reservoirs through use of accepted flocculation techniques.

Establish a maintenance plan for each sport fish reservoir to ensure that the sites are kept in acceptable condition.

Watershed, Wetland Habitat, Fisheries, and Habitat for Waterfowl and Other Wildlife

Fence reservoirs to control levels of livestock use where such use currently conflicts with objectives for fish and wildlife habitat and watershed protection.

Where feasible and necessary, enclose areas adequate to reduce siltation and to minimize livestock crowding of fences around reservoirs. Provide for sediment storage, protection of dams, and creation of adequate nesting cover.

Plant vegetation and install trash-catcher type structures in drainages entering reservoirs to capture silt and to extend the functional life of the watering source and habitat.

Dig silt retention pits in new reservoirs to increase longevity.

Plant and maintain trees and shrubs to benefit fish, wildlife, and watershed conditions at reservoir sites.

Use available water from wells, canals, agricultural drainages, oil fields, and streams to improve fish and wildlife habitat.

When reservoirs are fenced, install water-gaps or off-site watering facilities where needed for livestock watering.

Plant vegetation, install protective barriers, or place riprap on dams and spillways where needed to extend reservoir longevity.

Where water clarity needs to be improved and sedimentation needs to be reduced to meet fish and wildlife needs, incorporate necessary watershed practices such as seeding or control of grazing.

Control wetland vegetation in and associated with reservoir sites as needed to benefit fish and wildlife.

Utilize off-channel sites for reservoirs where in-channel placement is unfeasible but water is available.

Increase reservoir water storage where needed for fish and wildlife habitat through silt removal, transfer of water, and raising of dams, spillways, and weep pipes.

Recommend that WGFD introduce nongame fish in suitable reservoirs where they will reproduce and serve as a food source for wildlife.

Install snow fences to increase runoff into reservoirs.

Prevent indiscriminate placement of salt or protein blocks adjacent to reservoirs.

Encourage establishment and maintenance of beaver along perennial drainages to improve fish and wildlife habitat.

EVALUATION AND MONITORING

Habitat condition and other factors will be evaluated, and monitoring will be conducted according to the schedule in table 2 so that BLM personnel can determine whether or not HMP objectives and planned actions are being achieved. Priorities for proposed projects will be reestablished each year on the basis of existing and newly collected data so that maximum benefits can be achieved at minimum cost.

In conjunction with the WGFD, the BLM will monitor fisheries and habitat to collect necessary management data on recreational use, habitat quality, and species diversity and abundance. Use by waterfowl, big game, upland game, and other wildlife will be monitored at each wetland area where projects or planned actions are implemented. Vegetative response and habitat condition will be evaluated at the same time.

In fiscal years 1987 and 1988, the BLM will study specific wetland sites about which additional information is required. Information on conditions such as water level stability, water quality, condition of vegetation, and livestock grazing use will be needed before specific projects can be developed to benefit wildlife habitat.

Monitoring efforts in FY 1987 and FY 1988 will be aimed at collection of more extensive data on habitat condition and the potential for improvement of high priority wetlands that require monitoring before recommendations can be made (as listed in table AP3-3 in appendix 3). Monitoring in subsequent years, will be limited to evaluation of project success (i.e. improved wetland habitat) so that priorities for proposed projects can be reassigned if necessary. That monitoring can be conducted by BLM wildlife biologists during field project work, or in some instances by the range staff during range surveys, so that monitoring costs can be minimized.

Wetlands on which vegetation needs to be protected by fencing or through a change in grazing activity are listed in table AP3-2 in appendix 3. Those areas will be monitored for season and duration of livestock grazing and success of planting, and projects will be evaluated.

Monitoring of wetlands that appear not to have been affected by livestock grazing (which are listed in table AP3-1 in appendix 3) will focus on waterfowl production, maintenance of habitat conditions, and evaluation of projects.

TABLE 2
TIMEFRAMES OF MONITORING AND EVALUATION

<u>Type of Study</u>	<u>Method</u>	<u>Period When Done</u>	<u>Responsibility</u>	<u>Objective/Standards</u>
Waterfowl use and production	Observation	April through July of each year	BLM and WGFD	To observe nesting and fledging success
Other wildlife use	Observation	April through July of each year	BLM and WGFD	To check species diversity and abundance
Vegetation-habitat survey	Photo plot qualitative observation data	June through September of each year	BLM	To evaluate habitat condition, trend, and species diversity
Project effectiveness	Observation	April through November of each year	BLM	To evaluate habitat use by wildlife
Recreational use	Observation	Irregularly during each year	BLM and WGFD	To evaluate use by recreationists
Fish population surveys	Netting creel census	Every 2 to 3 years	WGFD	To check species abundance, diversity, reproductive success
Aquatic habitat survey	Physical, chemical, and biological surveys	Irregularly	BLM and WGFD	To evaluate habitat condition

COORDINATION

COORDINATION WITH OTHER BLM PROGRAMS

Range Management

All the wetland sites on BLM-managed public land in the HMP area lie within grazing leases and are used by both wildlife and livestock. Therefore, cooperation between wildlife personnel and range staff will be necessary to achieve the HMP objectives.

In many cases wildlife and range programs will both benefit from the construction of new reservoirs and maintenance or improvement of existing wetlands because these actions will improve both livestock watering and fish and wildlife habitat. In addition, the livestock industry will benefit from improved livestock distribution and forage utilization, watershed conditions, and water quality. Increased vegetation production around protected reservoirs will serve as a filter for silt. This will increase life expectancy of reservoirs and decrease frequency of repairs.

All HMP projects will be integrated into proposed AMP management efforts. Where no AMP is proposed, the project objectives will be coordinated with the range staff and the livestock lessee. Livestock access to water will be considered in all HMP projects.

Section 6740 of the BLM Manual spells out BLM policy on wetland-riparian area protection and management. The following paragraphs from the manual relate specifically to grazing management and to reservoir construction and maintenance.

6740.23A.1: Design grazing systems and management practices to give riparian vegetation the protection necessary to maintain and restore habitat cover and diversity, shoreline-streambank stability, reduce sedimentation, provide water temperature ranges suitable for desirable aquatic life, and to meet State and Federal water quality standards. BLM Manual Section 4111.32D5c (allowances for wildlife), 4112.11A4a (habitat requirements for small wildlife forms), 4112.1A4b (fish habitat), 4112.11A4e (exclusion from ungulate grazing), and 4412.21F (crucial areas) establish policy and procedures applicable to range management and protection in wetland-riparian habitat. Grazing management procedures may include livestock management practices or protective fencing to exclude grazing use in riparian areas.

6740.34: Construct and maintain reservoirs in a manner, where possible, to expand and maintain downstream wetland and riparian habitat. Closely coordinate all water development and maintenance plans with wildlife, fisheries, and watershed specialists to maximize protection and enhancement opportunities. Protective fencing to maintain vegetation for wildlife food and cover, and soil stability should receive strong consideration as a viable component of the project.

The use of reservoirs by waterfowl for brood protection is directly related to habitat conditions of food and cover. Use by waterfowl breeding pairs is

directly related to the intensity of livestock grazing around reservoir sites (USDI, BLM 1979a). Brood production is also constrained by the quantity and quality of food and cover.

Waterfowl production may be increased by reducing grazing intensity or at least staying within recommended stocking rates where overgrazing occurs. The preferred method for allowing vegetative reproduction and increased vigor is through a deferred or time-controlled grazing management plan whereby all pastures periodically receive rest from livestock use. In general, an increase in vegetation resulting from a deferred grazing system will also result in an increase in waterfowl numbers.

In addition, adequate residual vegetative cover provides cover and food for fish, and it reduces siltation and wave erosion of banks and dams. Therefore, deferred grazing can be expected to improve fisheries habitat.

According to Gjersing (1975), range management can increase benefits to waterfowl in rest-rotation systems by applying the following guidelines:

Construct retention-type ponds instead of dugouts or pipeline watering systems whenever possible.

After the end of the earliest treatment (spring or early summer grazing), move cattle out of the pasture and close the gates behind them. This will allow for regrowth of the vegetation and provide residual cover for nesting the following spring.

Delay grazing of pastures with residual cover until incubation is completed on most waterfowl nests (approximately July 1 in this area).

So that problems in range management can be avoided, the wildlife biologist, Buffalo Resource Area, will keep range personnel fully informed of HMP proposals. In this way, priorities for project locations can be determined. Likewise, to ensure that fish and wildlife benefits can be achieved from HMP projects, the range personnel will keep the wildlife biologist informed about changes in grazing practices.

Recreation Management

Recreational activities in the HMP area are primarily big game hunting, small game hunting, waterfowl hunting, and fishing. These activities are compatible with the objectives of the HMP and serve partially as the economic justification of proposed projects.

The establishment of sport fisheries is geared to increasing fishing opportunities for local residents. Additional waterfowl production will increase and improve opportunities for hunting both locally and elsewhere. Habitat improvement sites also will result in additional opportunities for big game, upland game, small game, and for nonconsumptive activities (such as photography and wildlife observation).

The BLM and the WGFD have limited capabilities and funding for construction and maintenance of recreation facilities. Therefore, attempts will be made to get local agencies or private organizations to contribute labor or materials. Management of recreational use of newly established fisheries or hunting areas will be the responsibility of the recreation program.

Wildlife and recreation personnel will cooperate in developing access plans, signs, health and safety facilities, publicity releases, and methods of evaluating public use.

Wilderness Study Area Management

The Fortification Creek wilderness study area (WSA) is within the HMP area. A description of resource values in the Fortification Creek WSA appears in the Buffalo Wilderness Study Report (USDI, BLM 1986).

Until Congress acts on designation or nondesignation of the Fortification Creek WSA as wilderness, the BLM's Interim Management Policy and Guidelines for Lands Under Wilderness Review (USDI, BLM 1979b, 1983b) serves as the principal guide for managing the WSA in the HMP area. The goal of the interim management policy is to ensure that the wilderness qualities inherent to each WSA are unchanged at the time Congress makes its final decisions. This means that BLM wilderness study areas will be managed to preserve their wilderness character in a manner that will leave them unimpaired for future generations, should they be designated as wilderness.

Some uses of wilderness such as mining, grazing, and motorized travel do not conform to the philosophy of wilderness but are specifically permitted by the Wilderness Act of 1964 where valid existing rights occur. These nonconforming but accepted uses will be managed in a manner that would prevent unnecessary and undue degradation of the area's wilderness character.

Forest Management

There are no forest management plans within the HMP area, and there are no trees of commercial value on reservoir or wetland sites. When any tree planting is planned near wetland sites, the resource area wildlife biologist will consult with the forester.

Soil and Water Management

The improvement or maintenance of watershed conditions has a high priority so that the HMP objectives can be achieved. Less than desirable watershed conditions adjacent to wetland areas result in poor water quality, silting of reservoirs, and erosion. Increasing and maintaining vegetation cover near wetland sites will improve soil stability and water quality.

The assistance of district hydrologists will be needed to define water yields and quality and to obtain water rights for some projects. It will be necessary for the district soil scientist to evaluate proposed projects to determine water-retaining ability of the soil.

Minerals Management

Present oil and gas lease stipulations prohibit surface disturbance within 500 feet of reservoirs or riparian areas. Extra care should be taken to stabilize disturbed soils where reservoirs exist downstream from proposed drill sites or mine pits. To prevent needless degradation of habitat for waterfowl and other wildlife, the BLM will thoroughly evaluate any proposal to remove water from reservoirs for drilling purposes. In most cases, HMP improvement projects will not impair oil and gas exploration or production.

Fire Management

No prescribed burns are planned adjacent to reservoir or wetland sites; however, site-specific burn plans proposed by the range program will address the effect on watersheds, downstream siltation, and wetland areas.

Support Activities

Personnel from the Casper District Division of Operations will evaluate all planned actions and proposed projects for engineering and construction feasibility. Operations personnel will be responsible for project survey, design, and contracting of the projects. Some projects may be constructed by temporary fire crews or volunteers when such work does not conflict with their assigned duties.

The assistance of the resource area realty specialist will be needed in projects requiring land exchanges and access easements.

Cultural Resources

All project locations will be assessed for cultural or historic significance by the area archeologist or the district archeologist before any construction is begun.

COORDINATION WITH OTHER AGENCIES AND ORGANIZATIONS

Federal Agencies

Federal agencies with responsibility within the HMP area are the Forest Service (FS), the Soil Conservation Service (SCS), and the U.S. Fish and Wildlife Service (USFWS). The BLM has discussed coordination with FS, SCS, and USFWS personnel to explain the objectives and planned actions of the HMP. No cooperative plans or commitments of funds were solicited from these agencies, but the BLM recognizes the need for full interagency coordination.

State Agencies

Through a HMP specific memorandum of understanding between the BLM and the WGFD, the WGFD is codeveloper of the HMP. Personnel of the WGFD's Game Division District 3 and Fisheries Management Area 30 in Buffalo have been involved in field coordination and preparation of the HMP. WGFD personnel provided information on wildlife populations and management objectives and reviewed the HMP.

All HMP objectives have been integrated with the WGFD's strategic plan objectives and goals. The agency will be continually involved in the plan through formal and informal meetings for review and update of specific project proposals.

The BLM will coordinate with other state agencies such as the Department of Environmental Quality (DEQ), the State Engineer's Office, and the State Land Board as needed.

Public

Landowners and grazing permittees will be contacted on HMP objectives and planned actions that may affect their livestock operations. A news release will be issued to explain HMP objectives and planned actions and to solicit public comments.

Coordination of the HMP and future projects with grazing lessees is very important because of their interest in stock watering reservoirs. The resource area range staff will ensure proper coordination of proposed projects because of their knowledge of grazing allotments and their working relationships with ranchers.

TABLE 4
SUMMARY OF HABITAT MANAGEMENT PLAN DEVELOPMENT COSTS

	ESTIMATED COSTS AND WORKMONTHS BY DEVELOPMENT YEAR											
	Year One FY88		Year Two FY89		Year Three FY90		Year Four FY91		Year Five FY92		Total Five-year Costs	
	Number of Work- months	Dol- lars (000)	Number of Work- months	Dol- lars (000)	Number of Work- months	Dol- lars (000)	Number of Work- months	Dol- lars (000)	Number of Work months	Dol- lars (000)	Number of Workmonths	Dollars (000)
ADMINISTRATION AND PREPARATION	3	7.5							1.0	2.5	4.0	10.
IMPLEMENTATION:												
Project survey and design	1.0	2.5	1.0	2.5	1.0	2.5	1.0	2.5	1.0	2.5	5.0	12.5
Project work	1.0	2.5	1.0	2.5	1.0	2.5	1.0	2.5	1.0	2.5	5.0	12.5
Material		1.0		5.0		5.0		5.0		3.0		19.0
Public affairs (signs, brochures, etc.)					0.5	1.2					0.5	1.2
Construction (including access, roads, rights-of-way, etc.)	0.5	1.2	0.5	1.2	0.5	1.2	0.5	1.2	0.5	1.2	2.5	6.0
MAINTENANCE			0.5	1.2	0.5	1.2	1.0	2.5	0.5	1.2	2.5	6.1
EVALUATION AND MONITORING	1.0	2.5	1.0	2.5	1.0	2.5	1.0	2.5	1.0	2.5	5.0	12.5
Research												
TOTAL BLM COST	6.5	17.2	4.0	14.9	4.5	16.1	4.5	16.2	5.0	15.4	24.5	79.8
ESTIMATED CONTRIBUTIONS												
State wildlife agency	0.5	2.0	0.5	2.0	0.5	2.0	0.5	2.0	0.5	2.0	2.5	10.0
Other												
TOTAL CONTRIBUTIVE FUNDS	0.5	2.0	0.5	2.0	0.5	2.0	0.5	2.0	0.5	2.0	2.5	10.0

ECONOMICS

INTRODUCTION

A comprehensive economic analysis of the various planned actions in this HMP cannot be made at this time because the project proposals that have been made are only preliminary proposals. Each project will entail a benefit/cost ratio and a least-cost approach to ensure maximum benefits for the money expended. The estimated costs of materials and planned actions are listed in table 3.

TABLE 3
ESTIMATED COSTS OF PLANNED ACTIONS OR MATERIALS

Fence (4-strand barbed wire) material	\$1,200 per mile
Reservoir construction (\$0.67 to \$0.76 per yard)	(avg.) 4,000 per reservoir
Spring development (with pipeline)	(avg.) 4,800 each
Floating island or goose nesting structure	40 each
Tree seedlings (cottonwood, willow, Russian olive)	30 per 100

This HMP is based on the BLM's ecosystem management approach, and nearly all side effects from planned actions and projects will be beneficial. For example, HMP projects will help to reverse the downward trend in the nation's waterfowl numbers and will improve conditions for all wildlife that use wetlands. Additional effects will be improvement of watershed, forage condition, and water quality. These positive aspects will be considered in all project evaluations. The present cost estimates for proposed projects are shown in table 4.

COSTS AND FUNDING NEEDS

Project cost and funding needs for the next five years are presented in table 4. The cost for fisheries reservoir construction was not included because no specific sites or construction costs have been identified. The costs and work months would significantly increase whenever a fisheries reservoir was constructed. As a general rule, specific wildlife projects requiring significant expenditures and driven by wildlife needs will be funded by the wildlife program. When insignificant expense is involved in minor project modification, or when the action is necessary to increase wetland site longevity, funds usually will come from the range betterment program. For example, reservoir maintenance or new construction for livestock water will be funded by the range betterment program, but fencing, vegetation planting, or construction for fishery purposes will be funded through the wildlife program.

Project survey, design, and funding will be requested on at least five reservoirs each year. Habitat inventory data will be evaluated each year so that reservoirs most in need of improvement will be improved first. Priorities will be assigned to ensure the maximum improvement of wetland habitat for the funds expended.

ECONOMIC BENEFITS

Waterfowl

Increased numbers of waterfowl will be available for consumptive and nonconsumptive use on-site in the HMP area and off-site when habitat is increased and improved. Consumptive use is hunting of local and migrant ducks and geese before freezeup. The value of hunting and fishing days are derived from Wyoming Game and Fish Department data (WGFD 1985).

Nonconsumptive uses of waterfowl and wildlife will be limited to observation and photography from vehicles near main roads. These uses will increase as waterfowl and wildlife numbers increase through habitat improvement.

Habitat improvement projects eventually will be carried out on approximately 50 wetland sites. Waterfowl production is expected to average two to three broods per site with an average of six birds per brood, for an estimated annual increase of 600 to 900 birds.

About 20% of the ducks produced will be harvested (Bellrose 1976). The return to the state's economy for each duck harvested is \$26.00 (WGFD 1986). Using these figures, and assuming the 20% harvest occurs in Wyoming, the completed HMP would annually add between \$3,120 and \$4,680 to the state's economy annually. Not included in this analysis would be an additional but undetermined number of ducks harvested because the improved habitat conditions of the reservoirs which held them in the resource area longer than normal. Over a 20-year period the total return attributable to waterfowl hunting would be between \$62,400 and \$93,600.

Fisheries

If the two reservoirs are established for sport fishing, they will support an estimated total of 4,000 visits annually, assuming that the WGFD stocks trout regularly. Should habitat conditions warrant stocking of bass or other warm-water species, recreational fishing will depend on the establishment of a stable population and on the public demand for such species. Assuming that average visit is 3 hours, and that 12 hours of fishing equals one fisherman day, the value of providing fishing sites will amount to \$36,040 annually, according to the WGFD's economic expenditure value of \$36.04 per fishing day.

Nonconsumptive use of fisheries reservoirs also would increase if sanitation facilities and aesthetically pleasing settings such as trees and picnic areas were established. No estimates have been made of the amount of nonconsumptive use (such as photography and wildlife observation) that occurs at fisheries and waterfowl reservoirs, and there is no way to assign an economic value to these uses.

Actual fishery reservoir sites generally will be selected to achieve the optimum benefit/cost ratio and to minimize the cost of construction and maintenance. Establishment of fisheries reservoirs will benefit livestock, watershed, and other wildlife, as will waterfowl improvements.

Other

Projects to improve wetland habitat will benefit several game and nongame species. Opportunities for trapping furbearers and for hunting mule deer, antelope, game birds, and rabbits will increase when habitat conditions improve and when the animals' range is extended through creation of new watering sources. It is not possible at this time to calculate the value of these consumptive uses.

New or improved wetland habitat will also allow for better distribution, forage use, and water consumption by domestic livestock. The economic benefit derived from better rangeland use and water quality by livestock can be assumed in the Bureau's rangeland economic program. A cost/benefit analysis for livestock production associated with wetland projects will be done on a site-specific basis.

PUBLIC AFFAIRS

Specific public affairs actions to be carried out in connection with the HMP are as follows:

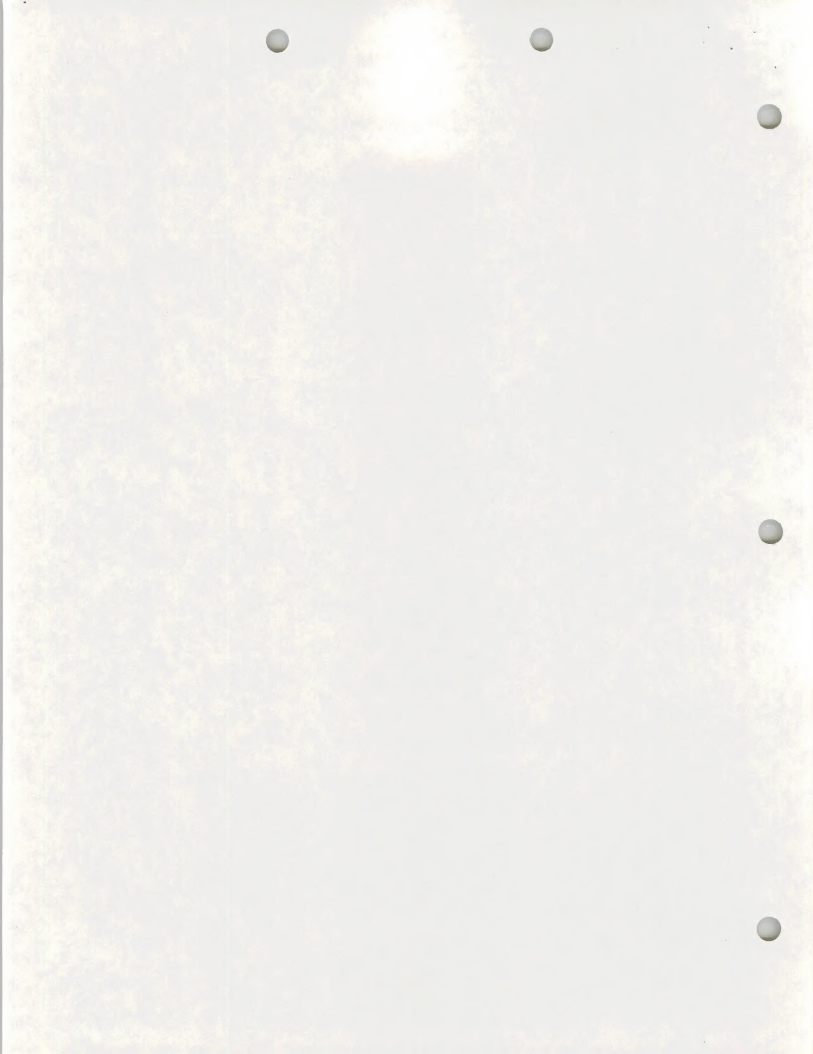
Copies of the final HMP will be distributed to cooperating agencies. Copies of the plan will also be kept in the district and resource area offices for review by public land users.

News releases will be prepared for local media to explain HMP objectives and planned actions.

Signs will be placed at some sites to give brief explanations of project purposes, use regulations, or access.

The BLM will continue coordination meetings with agencies and individual grazing lessees to receive information and learn about their concerns, as well as to inform them of planned actions.

APPENDIXES



APPENDIX 1: WYOMING GAME AND FISH DEPARTMENT
STRATEGIC PLAN OBJECTIVES, GOALS, AND RECOMMENDATIONS

OVERALL GOALS

The overall goal of the WGFD stresses cooperation with public land agencies to achieve desirable fish and wildlife objectives. The following are some specific strategic plan statements:

The WGFD will participate actively in federal, state, and local land use planning.

The WGFD will coordinate efforts with land management agencies to insure adequate consideration for wildlife in their long range plans.

GENERAL POLICIES

The strategic plan of WGFD contains numerous references that support efforts proposed in this HMP. For example, the WGFD projects that outdoor recreation statewide will triple by the year 2000. Some of the applicable policy objectives are listed below:

All wildlife should be managed to provide the greatest sustained human benefits. Both consumptive and nonconsumptive uses of wildlife should be structured to produce desired and worthwhile human experiences.

Optimum populations of wildlife are to be produced and maintained on all lands and waters in Wyoming suitable as wildlife habitat, consistent with other uses of such lands and waters. Through hunting and fishing, the available crop of wildlife species classified as game are to be utilized.

The best possible habitat conditions for all wildlife are to be maintained, consistent with other uses. Wildlife habitats which are open to public use are to be improved. Private landowners will be encouraged to do the same.

POLICIES FOR SPECIFIC WILDLIFE

The WGFD's strategic plan contains a number of statements related to fish, ducks and geese, antelope, mule deer, game birds, and small game. The following sections contain some of the statements that are related to the efforts of this HMP:

Fish

Encourage private landowners, developers, and other agencies to employ practices that are not detrimental to aquatic habitat.

Participate actively during the planning phase of reservoir and other developments affecting aquatic habitats.

Develop and implement methods to prevent damage to fisheries resulting from logging, mining, and livestock operations.

Investigate the potential of various game fish in waters that have marginal habitat conditions for survival of traditionally used trout species.

Increase public interest in game fish other than trout.

Increase fishing opportunity in areas of need through acquisitions, easements, habitat development and improvement, and improved sportsman-department-landowner relations.

Work with BLM to obtain a commitment of high priority being given to protection of aquatic habitats on their lands.

A significant increase of fishing supply may be realized if proper considerations are given to fisheries habitat in land use practices, land use planning, water development projects, and legislation. Conversely, without these considerations, sport fishing supply will be seriously reduced.

The primary goal in Region 3 is to maintain and/or increase the supply and diversity of sport fishing opportunity. Management efforts will be directed at bringing new waters into production and increasing production through more intensive management. Most waters will be managed under the basis yield concept, with species diversity as part of the program, which includes the development of warm and cool water fisheries in areas previously supporting a salmonid fishery. Catch restrictions may have to be utilized to distribute the catch more equitably.

Ducks and Geese

Maintain a population of at least 172,000 breeding pairs of ducks within the state.

Maintain a population of at least 5,000 breeding pairs of Canada geese within the state.

Procure key duck harvest habitat areas where possible.

Protect and manage wetland to maintain the habitat available to ducks in Wyoming.

Identify areas of concern and work with agencies or groups to sustain, enhance or restore existing habitat.

Trap and transplant geese to increase populations and potential harvest areas.

Acquire or develop nesting and/or brooding habitat which will be unattractive to summer recreationists.

Antelope and Mule Deer

Where feasible, increase the amount of available range through habitat manipulation (including controlled burning or water developments).

Where it is shown to be desirable, promote the development of water sources in arid areas.

Game Birds and Small Game

Maintain an occupied habitat area of at least 63,000 square miles for sage grouse.

Assist in public and private habitat conservation and improvement.

Direct management efforts towards the protection and improvement of habitat.



APPENDIX 2: CATEGORIZATION OF WETLANDS CONDITION

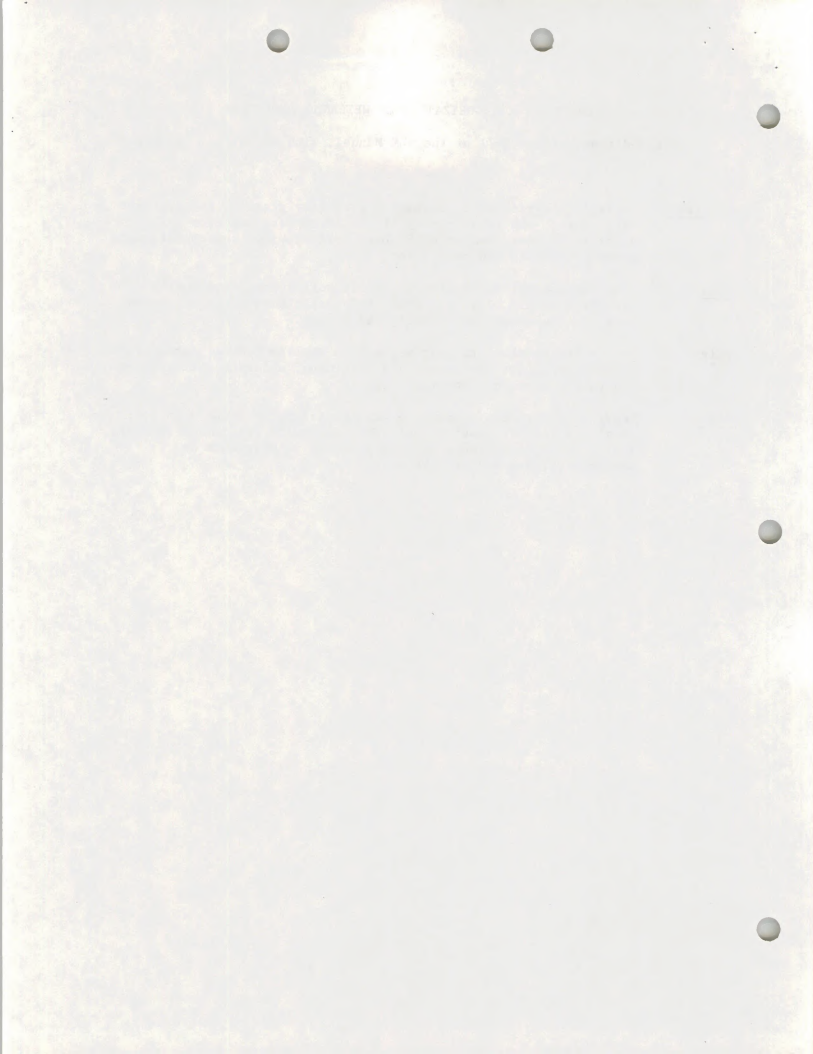
(Adapted from section 6671 of the BLM Manual, with additional criteria)

Excellent: Negligible use/damage; vegetation primarily grasses, sedges, forbs well rooted; sod intact; very little if any erosion from vegetation areas, less than 5% bare soil showing; submergents and emergents common and persistent.

Good: Some use/damage; vegetation generally well-rooted; sod mostly intact; 6 to 15% bare soil showing overall; some surface erosion evident. Submergents and emergents common.

Fair: Use or damage close to sod; vegetation shallow-rooted; submergents and emergents not persistent and in clumps; moderate soil erosion (16 to 50% bare soil showing overall).

Poor: Heavy to severe use/damage; vegetation generally cropped to sod; considerable soil showing (more than 25%) with sod damage serious; active surface erosion a serious problem; no emergents or submergents; dry most of the year.



APPENDIX 3: WETLAND SITES ON WHICH IMPROVEMENT PROJECTS ARE RECOMMENDED

Wetland sites were evaluated in the field, and recommendations were made for projects to improve waterfowl production and to enhance habitat for other wildlife. The sites were divided into three categories:

Wetlands in the first category are those that have not been heavily grazed. Actions planned for habitat improvement on these sites are planting of emergents, submergents, trees, and shrubs; construction of floating islands and/or nest structures; and weed control and dam maintenance (table AP3-1)

Wetland sites in the second category are those on which a change in livestock grazing or fencing is necessary to promote the establishment and proliferation of natural and planted wetland vegetation. Table AP3-2 lists the sites in this category and the projects recommended for them.

The third category of sites, listed in table AP3-3, are those that require additional monitoring before project recommendations can be made.

TABLE AP3-1
WETLANDS THAT DO NOT APPEAR TO BE LIMITED BY GRAZING ACTIVITY

Name/Location (Township, Range, Section)	Actions	(Fiscal Year)	Estimated Cost
Kaycee stockrest 44-82-22; S&NW	Monitor water persistence	(1988)	
Trabing Irrigation Reservoir 48-81-25; N&NW	Evaluate fishery potential; plant trees; obtain minimum pool	(1988)	
Indian Creek Reservoir 49-79-21; S&NW	Evaluate fishery potential; place floating island	(1989)	\$ 40
Wagner Bass 50-78-17; S&SW	Monitor fisheries; place floating island; install fencing	(1989)	\$ 40
Flying E 50-78-21; S&SE	Plant; carry out weed control; place float ing island	(1988)	\$ 90
Wagner No. 3 50-79-26; N&SE	Place floating island	(1988)	\$ 40
Half-and-Half 50-80-21; N&NW	Survey boundary; repair fence	(1988)	\$ 100
Hepp 52-78-4; S&NW	Place floating island	(1988)	\$ 40
Kaufman No. 1 43-82-35; S&NW	Monitor water persistence; place floating island	(1988)	\$ 40
Watt No. 1 57-77-10; S&SE	Monitor fence enclosure	(1988)	
Belle Fourche River: 46-71-9; SW	Evaluate fishery potential and access	(1988)	
46-72-25; NW	Evaluate fishery potential and access	(1988)	
Spring Creek Reservoir 58-72-30; N&SE	Monitor goose nest structure and water per sistence; blast potholes; fence enclosures	(1988)	\$1,000
Norfolk 55-73-26; N&NW	Monitor water quality; maintain island	(1990)	
Rocky Point 56-69-3; S&SE	Plant vegetation; place floating island	(1990)	\$ 40
Elk Creek No. 2 56-72-22; S&NE	Place floating island; install goose nest structure	(1990)	\$ 90

WETLANDS THAT DO NOT APPEAR TO BE LIMITED BY GRAZING ACTIVITY
(continued)

Name/Location (Township, Range, Section)	Actions	(Fiscal Year)	Estimated Cost
Elk Creek No. 3 56-72-22; SESE	Monitor water persistence	(1990)	
Brad's Reservoir 56-73-26; SESE	Survey boundary; monitor existing fishery	(1991)	
TR 56-74-29; NENE	Place floating island	(1991)	\$ 40
SA Creek Reservoir 56-74-33; NWSE	Repair cut in dam	(1990)	\$ 200
Trail Creek No. 1 Reservoir 56½-69-33; NNW	Place floating island; install goose nest structure	(1990)	\$ 90
Total Costs			\$1,710

NOTE: Costs were estimated as follows: Weed control, \$50 per acre; fence, \$3,000 per mile; floating island, \$40 each; and goose nest structures, \$50 each.

TABLE AP3-2
RECOMMENDED PROJECTS FOR WETLANDS
THAT APPEAR TO REQUIRE A CHANGE IN GRAZING ACTIVITY OR FENCING

<u>Location</u>	<u>Fences^a (feet)</u>	<u>Plantings</u>	<u>Miscellaneous</u>	<u>Material Cost^b</u>
45-83-24; NESW	1,050			
45-79-30; NENE	975	X		
44-82-23; SENE	900	X		
44-81-25; SWSW	1,350	X		
44-79-26; SESE	1,575	X	cut off peninsula to form island	
45-79-3; NESW	450	X		
44-78-6; SENW	1,200	X	cut off peninsula to form island	
47-78-34; NESW	600			
47-79-25; SESE	450	X		
48-78-22; NESE	1,200	X		
48-78-27; NWNW	1,000	X		
48-79-35; NWNE			thistle control	
48-79-6; SESE	850	X		
49-79-1; NWSE	1,350	X	thistle control	
50-78-17; NWNE	675	X		
50-78-4; SENE	1,275	X		
51-78-13; SWNW	1,200		spillway repair	
51-78-29; SENE	400		spring development	
51-74-21; NESE	990			
54-75-25; NENE	1,125	X		
54-75-25; NWNW	900			
54-75-32; NENE	900	X		
54-75-35; SESE	1,950	X		
53-71-26; NWSW	750	X		
55-71-25; SWSE	1,980	X		
55-72-8; SENW	750	X		
55-72-30; NWSW	1,350	X		
56-70-6; NENE	1,050	X		
56-71-4; NWNW	1,050	X		
56-71-4; NESE	750	X		
56-71-10; NWSW	825			
56-72-29; SWSW			dam repair	
57-71-27; NESE	900	X		
57-72-11; NWSE	1,200	X		
51-71-2; NENW	975	X	cut off peninsula to form island	
41-79-6; SESE	1,320	X		
41-80-12; SWSW	1,350	X		
42-80-35; NWSE	675	X		
42-81-5; NENE	1,050	X		
43-81-21; NWNE	1,200	X	cut off peninsula to form island	
43-82-31; NESW	825	X	island development	
55-78-2; NENW	300	X		
56-78-26; NWSE	900	X		
42-81-19; SWNE	900	X	cut off peninsula to form island	

a. Fence construction will not be pursued where grazing systems can be used to attain necessary wildlife and watershed improvement objectives.

b. Fence construction cost is estimated at \$3,000 per mile.

TABLE AP3-3
WETLANDS WITH GOOD POTENTIAL THAT REQUIRE MONITORING
BEFORE PROJECT RECOMMENDATIONS ARE MADE

Location (Township-Range-Section)	Acreage	Comments
45-81-28; SWSE	0.7	
43-82-1; NWNW	4.0	spring fed; stock rest
44-82-26; SWNW	0.5	
44-79-10; SWNW	1.2	
48-76-8; NENE	3.0	
48-77-9; NWNE	0.5	artesian well
48-77-15; NWSE	0.5	artesian well
42-81-15; NESW	0.5	spring
41-80-12; SWSW	6.5	
49-79-2; SWSW	1.7	good waterfowl production
55-73-2; SWSE	1.0	
50-78-21; SWSE	2.0	
50-79-13; SWSW	2.5	
55-74-4; NENW	0.8	
50-80-9; NESW	1.0	
56-70-9; NWNW	1.5	
56-72-15; SWSE	1.6	
52-79-22; SWNE	3.0	
41-80-13; NWNW	1.5	
42-77-27; SESW	0.5	
43-78-30; NESE	1.3	
43-80-33; SWSE	2.5	oil discharge pit
43-80-33; SESE	2.5	
43-81-20; SESW	1.0	
56-74-9; NENW	1.0	
41-82-6; NESE	0.8	
41-82-7; NWNE	0.5	
43-82-31; SESW	2.3	
43-82-33; SENW	1.5	
43-82-33; SWSE	1.0	
55-77-5; SENE	1.0	
55-77-7; NWNW	1.0	
55-78-11; NWNE	1.5	Clear Creek
56-78-14; SWNW	2.0	
57-76-8; SWSW	5.6	
56½-69-34; SESE	1.5	
57-77-3; NWNW	1.0	
56-77-34; SWSE	1.0	
55-79-18; NENE	2.5	
48-70-3; NESE	1.0	
45-69-26; NWSW	2.5	
46-70-24; NESE	2.0	
57-70-32; SESE	1.5	
57-74-14; SENW	2.0	
48-74-3; SWSW	3.0	good waterfowl production

WETLANDS WITH GOOD POTENTIAL THAT REQUIRE MONITORING
BEFORE PROJECT RECOMMENDATIONS ARE MADE
(continued)

<u>Location</u> <u>(Township-Range-Section)</u>	<u>Acreage</u>	<u>Comments</u>
58-75-31; NE		Powder River
58-75-29; NENW		Powder River
44-78-16; NW; 17-NE		Powder River
57-76-30; SE; 29-SW		Powder River
51-75-5; SESW	3.5	elk calving area
54-74-31; SWNW	0.7	
53-71-31; SE; 32-SW	1.0	Little Powder River
53-74-31; SESW	2.0	existing fishery
51-69-23; SWSW	1.3	
53-71-11; NWNW	1.0	
54-72-25; NWSE	1.0	good waterfowl production

Environmental Assessment
Buffalo Wetland Habitat Management Plan

A. Description of the Proposed Action and Alternative

The Buffalo Resource Area proposes to implement a Wetland Habitat Management Plan to improve wetland habitat for wildlife and fish as recommended in the Resource Management Plan. Improvements to springs, streams and stock reservoirs will be through implementation of projects to repair dams, install fences to control livestock utilization of wetland vegetation, plant desirable vegetation, install waterfowl nesting structures, create potholes, construct stock reservoirs and other methods. Similar efforts will be employed at newly constructed reservoirs on public land specifically for sport fishing opportunities, waterfowl production, and big, small, non-game watering.

The purpose of the HMP is to implement management actions to attain desirable wildlife or fish and recreation benefits on existing and new stock watering reservoirs for these specific purposes. Numerous laws and executive orders as well as the recently completed riparian management objective for the Bureau provides the justification for such efforts on public lands. The BLM policies and guidelines for management of wetlands directly support proposed HMP projects and goals.

Specific objectives of the HMP are to implement habitat management practices on 50 reservoirs and attain waterfowl production wherever the opportunity exists. Other objectives are to construct a minimum of two new reservoirs for support of sport fisheries and to improve sport fisheries where practical in existing stock and irrigation reservoirs. A final objective is to construct new reservoirs and modify existing ones to meet other wildlife needs.

Project implementation within the HMP will be on a continuous basis as funding is received. Maintenance of HMP projects will also take place on a continual basis to ensure achievement of objectives.

At sites where livestock control is necessary to allow wetland vegetation to survive, water gap or off-site watering areas will be developed for use by livestock.

This EA assesses the general impact of the entire HMP effort. Individual EA's will subsequently be prepared for each specific project proposal.

No alternatives to the proposal have been identified except the "No Action" alternative.

B. Description of the Affected Environment

Condition of existing reservoirs and wetlands range from poor to good. The poor condition sites are heavily utilized by livestock whereas the good condition ones provide high quality livestock water and support numerous wildlife species. Most good condition reservoirs are characterized as being in winter cattle pastures.

A more detailed description of the affected environment is included in the HMP.

C. Environmental Consequences

All proposed HMP projects are designed to have positive impacts on wetland habitat conditions and improve conditions for support of wildlife and fish.

Modifications of existing and new stock reservoirs will entail minimal surface disturbance and should improve watershed conditions at each site. Livestock use will be considered at any site where needed. It is expected that more forage will eventually be available for use by livestock and wildlife on fenced pastures or wetland sites than is presently produced. The longevity of reservoirs will be increased and an improvement of water quality will result on most projects. Fences will be designed to not trap wildlife or livestock within enclosures.

Construction of proposed reservoirs specifically for sport fisheries, waterfowl and big game will have the same initial site impacts as presently occurs in building stock watering reservoirs. There will be no irretrievable or irreversible commitments of the resources. Each proposed site will be examined for archeological resources and, if necessary, projects will be modified or moved to minimize impacts.

A major emphasis for wetland enhancement will be through the range program. Ecologically sound grazing management programs will improve riparian and wetland areas on both deeded and public lands. The concept of managing an entire watershed rather than specific wetlands is more acceptable to the BLM as well as ranchers and recreationists. The timing, i.e. season of livestock use, as well as allowing proper vegetative regrowth from rest will be promoted through AMP's and or agreements between the BLM and livestock lessees.

*	**	Element	Remarks/Explanation
☒	☐	A. ENVIRONMENTAL FACTORS	
☒	☐	1. ACEC	
☒	☐	2. Unique Resources (Identify)	
☒	☐	3. T&E Species (Identify)	
☒	☐	4. Cultural or Historical Resources	
☒	☐	5. Wilderness/Wilderness Study Area	
☒	☐	6. Wild or Scenic River	
☐	☒	7. Flood Plains/Wetlands/Prime or Unique Farmlands	Positive Impacts
☒	☐	8. Prime or Sole Source of Drinking Water	
☒	☐	9. Public Health or Safety	
☒	☐	10. Other	
		B. OTHER FACTORS	
☒	☐	1. Violates Local/State/Federal Law	
☒	☐	2. Involves Uncertain/Unique Risks	
☒	☐	3. Involves Unresolved Resource Conflicts	
☒	☐	4. Sets a Precedent	
☒	☐	5. Is Highly Controversial	
		C. CUMULATIVE IMPACTS	
* Negligible Effect		** Consequential Effect	

D. Mitigation and Monitoring

AU identified mitigation measures were made a part of the proposed action. Monitoring will be carried out on all sites to document successes and failure of implemented projects. This data will be used to develop new projects or where maintenance work is necessary on established ones. Waterfowl production, wildlife use and recreational use will also be monitored at project sites. Area and district wildlife staff will be responsible for coordinating and conducting wetland habitat monitoring studies. The range program will also participate in the studies to ensure full coordination of grazing activities within the HMP projects.

E. Consultation and Coordination

Consultation took place with several members of the Wyoming Game and Fish Department. Informal discussions about the HMP took place with the SCS, Casper District, and Buffalo Resource Area staff. Public involvement will be an important aspect of the HMP efforts. Support from the ranching community is limited at this time and will remain so until some projects are implemented which show forage, watershed conditions, and water quality will be improved and that no action will be taken which eliminates necessary livestock watering sources.

Decision Record
Buffalo Wetlands Habitat Management Plan

1. Alternatives Considered

No Action.

2. Decision and Rationale

- A. Implement identified and proposed HMP projects as identified within the HMP.
- B. The identified and proposed wetland habitat improvement projects will increase water fowl production and create fishing opportunities. All other wildlife species which use wetland sites will also benefit from the improved habitat conditions. livestock will not be excluded from any necessary watering source. Most habitat improvement projects will improve forage production and water quality for livestock and wildlife use and will extend wetland longevity.

3. Conclusion

According to the analysis of the HMP in the attached Ea, I conclude this action will result in no significant adverse impacts to the environment and that no E.S. is necessary.

Glenn Bessinger
Buffalo Area Manager

3.22.88
Date

APPENDIX 5

MEMORANDUM OF UNDERSTANDING

1982

MEMORANDUM OF UNDERSTANDING
between
The Wyoming Game and Fish Commission
and
The Bureau of Land Management

Development of the Buffalo Resource Area
Wetland Habitat Management Plan

This Memorandum of Understanding (MOU) supplements and is pursuant to the state master agreement between the Wyoming Game and Fish Department and the Bureau of Land Management dated August 19, 1976.

A. Area

This MOU specifically covers the BLM's activity planning area known as the Buffalo Resource Area.

B. Objectives

1. Mutual Objectives: The Department and the Bureau wish to initiate and expedite the cooperative development of a wetland fish and wildlife habitat management plan for the Buffalo Resource Area which will qualify for funding under PL 93-452 (the Sikes Act) during fiscal year 1989, and thereafter.
 - a. The plan will be developed with fish and waterfowl as the "primary species" group, however, the habitat management area has a variety of important wildlife associated with the wetland riparian habitat.
 - b. The plan will be concerned with creation, maintenance, and improvement of habitat for fish and waterfowl production and for use by the multitudes of game and nongame species that utilize wetland habitat.
 - c. The plan will be developed to enhance and perpetuate appropriate consumptive and nonconsumptive uses of these fish and wildlife species.
 - d. The plan will include, but is not limited to, consideration of the following items as probable job inclusions:
 1. Construction of reservoirs for fish and wildlife habitat.
 2. Construction of waterfowl nesting structures, islands, and floating rafts.

3. Publicize project sites for recreationists.
4. Fencing to ensure control of grazing.
5. Installation of minimum maintenance user facilities and planting of trees to create desirable settings at fishing reservoirs.
6. Development of access across public lands to selected areas.
7. Development of access across state or private lands to selected public land tracts which will require easement acquisition.
8. Signing to identify public land and public use areas.
9. Plantings or other vegetation manipulation in selected areas to establish desirable food or cover plants for various wildlife species.
10. Ongoing maintenance of developments.
11. Utilize available water sources from irrigation and oil field activities for creation or improvement of fish and wildlife habitat.
12. Exchange lands where necessary to achieve optimum fish and wildlife habitat.
13. Coordinate with state land use planning.
14. Creating or improving watering sources for big game.
15. Water manipulation and/or impoundment in channels and waste water return drainages for development of fish and waterfowl habitat.

C. Operating Procedures

1. The Casper District Manager BLM, will assign appropriate personnel to cooperatively develop a draft Buffalo Resource Area Wetland HMP during FY 88, with the Wyoming Game and Fish Department.
2. The District Supervisor and the District Manager will request input to the draft plan from other specialists within their respective agencies as appropriate (i.e. waterfowl specialists, reatly specialists, access specialists, nongame bird biologist, etc.).

3. The personnel assigned to prepare the plan will submit the draft to the District Supervisor, Area Fish Supervisor, HaTS Coordinator, and the District Manager for review and further, will make any modification of the plan deemed necessary as a result of their review.
4. The personnel assigned to prepare the plan will finalize the plan making any modifications deemed necessary to establish its consistency with NEPA, Bureau RMP (Resource Management Plan) constraints, and any other appropriate Department or Bureau regulations or policies.

D. Special Stipulation

1. By State Statute and Commission Policy the Wyoming Game and Fish Department cannot participate or be a cooperator in any access or property right acquisition in which powers of eminent domain (condemnation) are utilized as a tool.

E. Annual Review

1. At least once a year prior to May 1, representatives of both agencies will review this agreement and the resulting habitat management plan to determine its status and to evaluate operating efficiency, progress, need for plan modifications, and to plan job accomplishments for the next budget year.

F. Modification or Cancellation

1. This agreement will become effective when signed by the designated representative of both agencies.
2. This agreement will remain in effect until modified by the parties in writing, and is renegotiable at the option of either party.
3. This agreement may be cancelled by either party upon thirty (30) days written notice to the other party.

G. Approval

We, the undersigned designated officials, do hereby approve this MOU for Sikes Act Implementation as authorized representatives for our respective agencies. The MOU shall become effective on the date when last signed and shall remain in effect indefinitely hereafter or until subsequently modified or cancelled as noted above.

BUREAU OF LAND MANAGEMENT

James M. Moore 4-1-88
District Manager Date

WYOMING GAME & FISH DEPARTMENT

Darryl Shorma 4/6/88
District Game Supv. Date

Robert L. McLowen 4/11/88
Area Fish Supv. Date

Bill Morris 3/30/88
Department Director Date

REFERENCES

- Bellrose, F. C.
Ducks, Geese, and Swans of North America. Stackpole Books. pp.
554.
- Burwell, R. W., and Sugden, L. G.
"Potholes: Going . . . Going . . ." In Waterfowl Tomorrow, pp.
369-380. Cited in USDI, BLM 1979a, below.
- Gjersing, Frank M.
"A Study of Waterfowl Production on Two Rest-Rotation Grazing Units
in North Central Montana." M.S. thesis, Montana State University,
Bozeman, MT.

"Waterfowl Production in Relation to Rest-Rotation Grazing."
Journal of Range Management 28 (1): 37-42.
- Mundinger, John G.
"The Influence of Rest-Rotation Grazing Management on Waterfowl
Production on Stock Water Reservoirs in Phillips County, Montana."
M.S. thesis, Montana State University, Bozeman, MT.
- Rundquist, U. M.
"Avian Ecology on Stock Ponds in Two Vegetational Types in North
Central Montana." Ph.D. dissertation, Montana State University,
Bozeman, MT.
- United States. Department of Agriculture. Forest Service
Wildlife Habitats in Managed Rangelands: The Great Basin of
Southeastern Oregon, by Jack Ward Thomas, Chris Maser, and John
Rodick. General Technical Report PNW-8-80. La Grande, OR: Pacific
Northwest Forest and Range Experiment Station.
- United States. Department of Agriculture. Soil Conservation Service
National Range Handbook. Washington.
- United States. Department of the Interior. Bureau of Land Management
Construction and Management of Stock Ponds for Waterfowl, by Robert
L. Eng, Jack D. Jones, and Frank M. Gjersing. Technical Note 327.
Denver, CO.

Interim Management Policy and Guidelines for Lands under Wilderness
Review. Original version, to be used with revisions of 1983.
(Washington.)

"Grass Creek Resource Area: Reservoir Habitat Management Plan."
Worland District, No. W1-WHA-A15. Plan on file at Worland District
Office, BLM, Worland, Wyoming.

Interim Management Policy and Guidelines for Lands under Wilderness
Review: Revised Version. Washington.

United States. Department of the Interior. Bureau of Land Management
Record of Decision for the Resource Management Plan/Final
Environmental Impact Statement for the Buffalo Resource Area.
Casper, WY.

Buffalo Resource Area, Wyoming, Wilderness Study Report.

Wooding, J.

"Census of Breeding Birds of the Roaring Creek Watershed."
Colorado Field Ornithology 18:36-41.

Wyoming Game and Fish Department.

Annual Report. Cheyenne, WY pp. 66.

BUREAU OF LAND MANAGEMENT
1701 EAST E
CASPER, WY 82601